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United States Patent [19][11] **Patent Number:** **5,399,346****Anderson et al.**[45] **Date of Patent:** **Mar. 21, 1995**[54] **GENE THERAPY**[75] **Inventors:** W. French Anderson, Bethesda; R. Michael Blaese, Rockville; Steven A. Rosenberg, Bethesda, all of Md.[73] **Assignee:** The United States of America as represented by the Department of Health and Human Services, Washington, D.C.[21] **Appl. No.:** 220,175[22] **Filed:** Mar. 30, 1994**Related U.S. Application Data**

[63] Continuation of Ser. No. 904,662, Sep. 8, 1992, abandoned, which is a continuation-in-part of Ser. No. 868,794, Apr. 15, 1992, abandoned, which is a continuation-in-part of Ser. No. 807,446, Dec. 13, 1991, abandoned, which is a continuation-in-part of Ser. No. 365,567, Jun. 14, 1989, abandoned.

[51] **Int. Cl.⁶** A61K 48/00; C12N 5/22; C12N 15/63; C12N 15/09[52] **U.S. Cl.** 424/93.21; 435/172.3; 435/240.2; 435/69.5; 435/69.51; 435/69.52; 935/62; 935/22; 935/32; 935/34; 935/57; 935/79[58] **Field of Search** 935/22, 32, 34, 57, 935/62, 79; 435/172.3, 240.2, 69.5, 69.51, 69.52; 424/93.21[56] **References Cited****PUBLICATIONS**

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[57] **ABSTRACT**

Primary human cells which are genetically engineered with DNA (RNA) encoding a marker or therapeutic which is expressed to be expressed in vivo. Such engineered cells may be used in gene therapy.

14 Claims, 6 Drawing Sheets